EXHIBIT 8

Response to CTIA RFI for Number Portability

GTE

Telecommunication Services

Telecommunication Services

Response to Number Portability

Request for Information

for the

Cellular Telecommunications Industry Association

Reference Number ST.96.001.RFI

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PROPRIETARY

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Executive Overview

GTE Telecommunication Services Incorporated (GTE TSI) submits this response to the CTIA Request for Information (RFI) on Number Portability in order to facilitate the industry's discussion regarding wireless Number Portability (NP). We believe that a third-party system(s) or an MSID database can assist the wireless industry in fulfilling the federal NP mandate requirements.

The responses in the next section correspond to section 5 of the CTIA RFI. In addition, the last section provides background material on GTE TSI.

NP presents unique challenges to the wireless industry. Network capabilities such as roaming, registration and authentication are functions needed in a wireless environment that are impacted by NP. The wireless industry must address these impacts and issues in addition to the general NP issues facing the telecommunications industry (e.g., call routing).

Several NP alternatives were considered by the industry that can support call routing in an NP environment. The Location Routing Number (LRN) method appears to receive the most acceptance by the industry. As a result, the LRN method can also be used to provide call routing in a wireless NP environment with the appropriate modifications.

The proposed architectural arrangement suggested in this response incorporates the LRN method for call routing and provides a mechanism to support roaming, registration, and authentication in the wireless NP environment. The architecture promotes NP implementation while minimizing impacts on the existing network functions and ensuring the continuous operation of these functions.

All the existing systems that use the Mobile Identification Number (MIN) to derive information about a mobile station (e.g., mobile station's home system) will be affected, assuming that the MIN continues to function as the mobile directory number and mobile identification number. These existing systems may use a third-party mechanism or may query an MSID database to obtain correct home system information about portable MINs. Since some carriers already use a third-party system to support other network capabilities (e.g., roaming and authentication), they may want to continue to use a third-party for message relaying in an NP environment. Other carriers, who have database query capability, can obtain home system information from an MSID database. This architectural arrangement is flexible and satisfies the requirements in the federal NP mandate.

5.0 Specific Responses to CTIA RFI

5.1 Proposed Architecture Overview

The Number Portability (NP) architecture, shown in figure 1, provides service provider portability including the ability to support roaming. In addition to call delivery, it also addresses the authentication and registration aspects of porting a Mobile Directory Number (MDN) between service providers. This architecture assumes that the MDN will serve as the Mobile Identification Number (MIN) both before and after NP (e.g., the MDN and MIN remain coupled as it is today).[1] A discussion of the separation of MDN and MIN can be found in section 5.2.1 on page 9. Given today's linkage between MDN and MIN, existing systems in an NP environment would not be able to rely upon the MIN to identify the home system of the mobile station for processes such as authentication and roamer registration. This prohibitive effect occurs when a serving system first attempts to communicate with the mobile station's home system (e.g., for registration, authentication, etc.). The proposed arrangement minimizes changes needed to existing networks to support NP.

The end-to-end proposal should include but is not limited to:

- *Network elements*

The wireless Service Management System (SMS) contains mapping for Mobile Station Identification (MSID) (e.g., MIN or IMSI) to home system address (e.g., HLR) nationwide. The Home Location Register (HLR) address may be a Signaling System 7 (SS7) point code or X.25 address. This eliminates the need for the STP to perform a Global Title translation (GTT). Although the HLR address may also be a directory number that can be translated with a 6-digit GTT to identify the HLR, this method is not recommended. A third-party may be selected to administer and maintain the MSIDs in the wireless SMS. Service providers may obtain a copy of its content for local usage and keep the information in a local wireless SMS and disseminate the information to their MSID databases. Service providers should inform the wireless SMS of its new subscribers. The wireless SMS then distributes the update information to all the MSID databases. The interface to the wireless SMS should be defined by the wireless industry.

The MSID database when consulted (e.g., during the registration or authentication process) will provide a serving system the necessary information for communication with a subscriber's home system.

The third-party system may be employed by service providers that choose not to maintain their own MSID database. The third-party system provides the MSID database function and the message relaying function. There can be multiple third-party systems. Each third-party system may serve certain wireless systems. Some third-party systems also provide existing network capabilities such as roaming services (e.g., Follow Me Roaming, FMR) and SS7/X.25 interworking. Service providers employing the third-party system for these capabilities may find it advantages to also use the third-party system for NP support.

[1] If this assumption does not hold true, the architecture may be modified accordingly.

The NP SMS database contains Location Routing Number (LRN) mappings for wireline and wireless subscribers within the region. In an NP environment, there is no distinction between a directory number of a wireline subscriber from the MDN of a wireless subscriber. This database will be deployed on a regional basis. Service providers inform the regional SMS of any LRN updates resulting from new subscribers. The updates are distributed to local SMS. The MSC/VLR should also use the same interface the industry defined for a wireline switch to inform the NP SMS of LRN updates.

Service providers obtain the LRN information from the NP SMS and maintain it in the local SMS. The local SMS distributes update information to local NP database/SCP. A switch consults the local NP database/SCP for the LRN of the recipient switch of a dialed number.

- *Triggering*

Wireless MSCs may not be able to support Advanced Intelligent Network (AIN) or Wireless Intelligent Network (WIN). If they do, they can use the interface specified by the associated NP database and use the Info_Analyzed detection point. If they do not support call models, they may use INAP or IS-41 messages to get the LRN without following AIN/IN/WIN triggers and call models.

The MSC may also support pre-query screening such as if the dialed number is not a portable number then no database query is needed and if it is a portable number perform a query only for interswitch, intra-LATA calls. Inter-LATA calls are routed to the appropriate interexchange carrier (e.g., caller's presubscribed interexchange carrier).

- *Gateway requirements*

The third-party systems or the MSID database can also provide gateway function (e.g., to the NP database).

- *Network Routing Number entity*

The LRN in a wireline/wireless network is the 10-digit physical address of a switch. It has the NPA+NXX+XXXX format.[2] One of the functions of an LRN is for call routing to the destination switch in an NP environment. The LRN can be the network address of a mobile switching center (MSC) or a wireline switch. The LRN may point to the home MSC/ gateway MSC for call routing to the home. The LRN may point to the serving MSC for call routing to the serving system.

[2] Only the first 6-digit is used for routing a call to the destination switch. There are discussions in the industry for using the last 4 digits of the LRN to carry specific location information about the subscriber (i.e., the Geographic Unit Building Block (GUBB) by Bellcore) for rating usage and for carrier selection during call routing when subscribers are allowed to port numbers outside of a rate center.

- *Central Database*

The wireless SMS should be a national database. However, one central database may not be necessary. There can be several central databases with each one serving one or more wireless systems. Also, the central database can be supported by a third-party or several third-party providers.

- *SS7 Global Titles*

NP does have some impact on current SS7 GTT processes. SS7 GTT of MIN-to-HLR, in an NP environment, will require a 10-digit translation if ported MDNs are used as MINs. The proposed architectural arrangement avoids the 10-digit GTT impact on STPs and all 10-digit GTT-like mapping at the visited system by using the MSID database to provide the MIN-to-HLR translations. There is also no need for a 6-digit GTT at the STP because the MIN is mapped to the HLR address (e.g., SS7 point code or X.25 address) by the MSID database or by the third-party system.

SS7 Global Title Translation (GTT) of IMSI-to-HLR can be a 6-digit translation unless IMSI is a pseudo-IMSI that is MIN-based. When pseudo-IMSI is used, the same issues and solutions described for the MIN will also be applicable. In the full IMSI case, the existing GTT practices (e.g., 6-digit GTT) may continue to be used. MIN-to-MSC and IMSI-to-MSC are not used today.

- *System performance*

Calls to a portable number will experience a longer post dialing delay due to additional switch processing and the number translation process. Processes that use a lookup table will take longer because the table will be larger and more complicated due to NP. The MSC will take more time to identify the homers from the roamers because its internal table(s) will be larger and more complicated. The MSC call processing capability will be reduced due to the additional processing NP calls require.

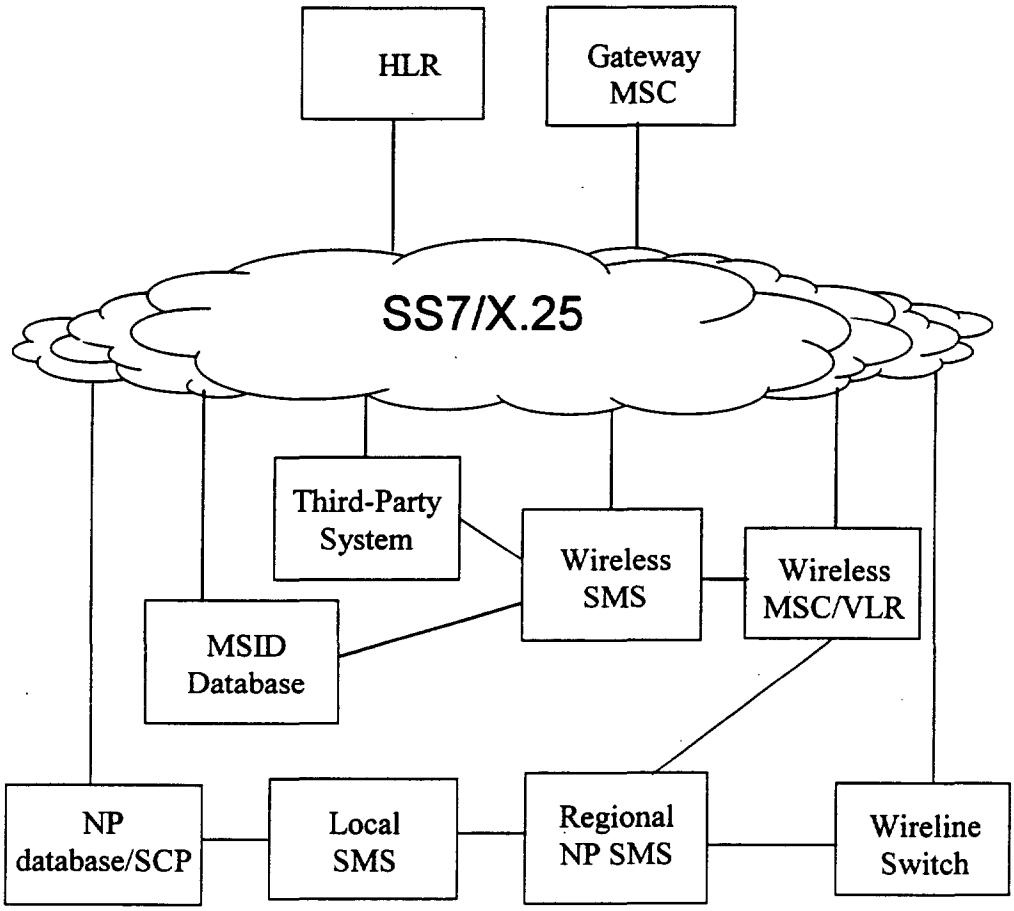

Figure 1 - Number Portability Architecture

5.2 Network Functionality

Please include a detailed description of each network functionality with the associated call flows and involved network elements.

5.2.1 Registration

How should mobile registration be accomplished under number portability?

When a mobile is within the coverage area of its home system, registration may take place as it does today. However, the existing roamer registration process will need to be modified in an NP environment.

When a roamer enters a visited system and wishes to obtain telecommunication services, the roamer's mobile station will initiate the registration process. The mobile station sends its MSID (e.g., MIN) and Electronic Serial Number (ESN) via a control channel to the visited system. The MSID allows the visited system to determine that the mobile station is a roamer. Upon detecting the roamer in its coverage area, the serving system may use one of four ways to send a registration message (e.g., registration notification) to the home system (e.g., HLR).

(1) Internal lookup table at the serving MSC/VLR that maps MSID to the HLR address.

(2) The STP using the GTT capability maps the MSID to the SS7 address of the HLR.

(3) The registration notification routed via a third-party. The third-party uses a translation table to map the MSID to the HLR address.

(4) The serving MSC/VLR can query the MSID database for the HLR address of the dialed MSID.

The first and second methods will not be feasible in an NP environment, if the MDN is used as MIN, because the lookup table or the GTT table would be so large that table management become impossible. In addition, it would be difficult to synchronize the large number of tables involved with the frequent data updates. Thus, the third or fourth method is more realizable and preferred.

If a third-party is used for message relaying and assuming that registration is the first process that requires the visited system to communicate with the home system. Figure 2 depicts the registration procedures and the descriptions are as follows:

(1) When the MSC detects a registration from a mobile station, it sends a registration notification message to the VLR.

(2) The VLR recognizes that the mobile station is not registered to its domain. It notifies the third-party system that the roamer initiates registration by forwarding a registration notification message.

(3) The third-party system[3] translates the MSID to the home system (e.g., HLR) address.

(4) The third-party relays the registration notification message to the roamer's home system (e.g., HLR) using the home system address (e.g., the SS7 address or X.25 address of the HLR).

(5) The home system registers the mobile station at the visited system and returns a registration notification acknowledgment to the visited system.

(6) The mobile station is now registered with the visited system.

Although not shown in the figure, the home system will notify the old serving system to deregister the mobile station by sending a registration cancellation message because it is no longer in its coverage area.

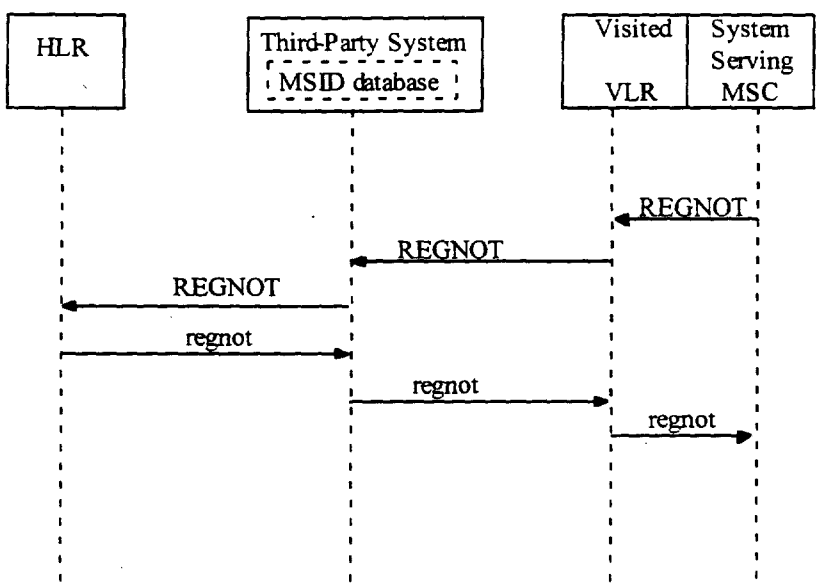

Figure 2 - Visited system uses a third-party for message relaying

If a visited system uses an MSID database and assuming that registration is the first process that requires the visited system to communicate with the home system. The procedures illustrated by figure 3 are as follows:

(1) When the MSC detects a registration from a mobile station, it sends a registration notification message to the VLR.

(2) The VLR recognizes that the mobile station is not registered to its domain. It launches a query to the MSID database with the mobile's MSID (e.g., MIN).

[3] The MSID database may be combined with the third-party system, as shown in the figure.

(3) The MSID database locates the home system identification (e.g., HLR address) for the MSID and returns a query response to the visited system with this information.

(4) The visited system sends a registration notification message to the roamer's home system (e.g., HLR) using the information (e.g., HLR address) obtained from the MSID database.

(5) The home system registers the mobile station at the visited system and returns a registration notification acknowledgment to the visited system.

(6) The mobile station is now registered with the visited system.

Again, not shown in the figure is the home system informing the old serving system to deregister the mobile station.

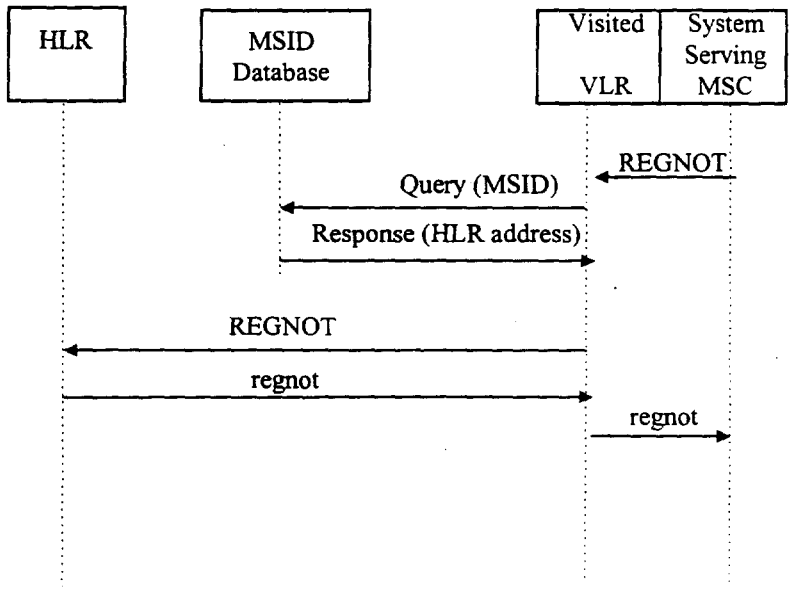

Figure 3 - Visited system queries the MSID database

Given that today we use the MIN which is currently the Mobile Directory Number (MDN) and that we have agreed to move to the use of the IMSI with the new digital technology, what process should be used to register mobiles under NP?

Even if IMSI can be used, there are still phones using MINs that must be supported for their registration under NP.

Is there a solution to avoid changing the imbedded base of analog phones?

The selected solution is likely to have no impact on the existing analog phones (or phones with MIN). The networks are to be enhanced to support NP, not for particular type of mobile stations.

Could a process separating MIN and MDN be used?

Conceptually, the MIN and the MDN are logically independent identifiers used for different purposes. The MDN is used to route calls to a subscriber's home system so they can be delivered to the subscriber. The MIN is used by the serving system to derive an address that can be used to route IS-41 messages to the home system's HLR of the mobile station. It is also used to identify the mobile station for information exchange between the home and serving system and for settlement between the systems.

This distinction has always been implicit in IS-41. For example, the LOCREQ carries dialed digits from the MSC to the HLR, but the ROUTREQ carries the MIN from the HLR to the VLR. IS-41-C makes the distinction between MIN and MDN even more explicit. The VLR sends the HLR the MIN in a REGNOT, the HLR returns the MDN in the regnot.[4]

Nevertheless, for mobile station whose home system is in the United States or other areas within the North American Numbering Plan (NANP), the MIN is usually[5] derived from the mobile station's MDN. This has had practical benefits; it has allowed cellular carriers within the NANP to avoid a need for industry agreements or some other mechanism that could be used to administer the MIN numbering space as a separate numbering space.

In addressing the FCC's Local Number Portability ruling, the wireless industry must decide between two fundamentally different approaches, one of which retains the relatively tight coupling of MINs and MDNs and the other that breaks it The two scenarios are as follows:

1. The MDN and MIN are ported together. Under this approach, when a MDN is ported from a wireless carrier, the right to use that number as a MIN would also be ported from that carrier. Moreover, when a directory number is ported to a wireless carrier (whether from a wireline carrier or from another wireless carrier), the right to assign that number as a MIN would also be ported to that wireless carrier.
2. Only MDNs are portable and MINs cannot be ported. Under this approach, when a MDN is ported from wireless carrier, the donor carrier would retain the right to assign that number as MIN. Moreover, a wireless carrier would not receive the right to use a number as MIN when that directory number is ported to the carrier; it would have to assign the mobile station a MIN from its own MIN numbering space. (This implies that the mobile station would have to be reprogrammed.)

The choice between the two approaches will not affect the network changes needed to support call routing in an NP environment. Candidate solutions developed for call delivery or mobile call origination would apply equally whichever approach is followed.

The advantage of the second approach is that it would allow the continued use of existing MIN-to-HLR translations for IS-41 message routing without a need to expand these translations to full 10-digit translations. This approach is also consistent with the

[4] The MDN is included in the Profile macro.

[5] A number of exceptions to this general practice are documented in PN-3173.

planned evolution from the use of MIN to International Mobile Station Identity (IMSI), since that evolution will break the linkage between the identifiers used by a mobile station on the air interface and the subscriber's MDN. Its disadvantage is that it would require new industry agreements regarding the means that would be used to administer the MIN numbering space.

The advantage of the first approach is that it would continue the existing industry practice of a relatively tight coupling between MIN and MDN. Its disadvantage is that it will require either the expansion of existing MIN-to-HLR translation capabilities so that they can support full 10-digit translations or an enhancement to today's network architecture to introduce a new network element providing 10-digit MIN-to-HLR translations.

Could we use a process based on MSID?

Pseudo-IMSI should contain the MIN instead of the MDN if MIN and MDN are separated. The existing or future process should be based on the MSID which is a terminal ID (e.g., full IMSI or MIN).

Is there a solution that avoids 10-digit GTTs for routing MAP messages?

A third party can be used for message relaying or the HLR address can be obtained from the MSID database that would avoid the 10-digit GTT for routing MAP messages.

What are the international implications?

Message routing of the first message is likely to use GTT. If 10-digit GTT is not done at the STP, then the incoming message to the United States with GTT (i.e., Global Title Address (GTA) = MIN) should be routed to the third party or gateway MSC (that query the MSID database) for message relaying. Message routing after the first message is likely to use either GTT with the GTA as an E.164 number or a SANC code.

Include the implications on current standards, i.e., IS-41, IS-136, TDMA, CDMA, GSM.

There may be a need for new messages or additional parameters to support NP.

5.2.2 Authentication

There is no impact on the authentication calculation process if the MIN continues to be used and stored in the phone. The MIN will continue to be used for authentication calculation. There is also no impact on IMSI if it is stored in the phone and used for authentication calculation.

However, if authentication is the first process that requires the visited system to communicate with the home system, the visited system may use a third-party message relaying service to route the authentication request message to the home system. The visited system may also query the MSID database for a HLR address to route the authentication request message to the home system. The procedures are similar to the

registration procedures described in section 5.2.1. above and the reader could easily extrapolate the procedures using figures 2 and 3.

In the case where there is MDN and MIN separation and only MDNs are ported and MINs are not ported, authentication would be unchanged.

5.2.3 Call Handling

5.2.3.1 Call Origination on MSC

Can a determination be made that the call is to another mobile for potential services and call routing efficiencies?

The ratio between mobile terminated calls and all call termination is small. The ratio may increase when PCS operators are in service. However, it will be difficult for the MSC to determine whether a dialed number is a mobile number. This is especially true if NP is supported (e.g., need to analyze 10 digits). One way to have better routing efficiency is to indicate "wireless" (e.g., cellular/PCS) in the response from the NP database to the MSC. This requires that the NP database knows whether a number is cellular/PCS or not. There is no plan for this capability at the present time.

Will the MSC use the SS7 Call Completion to Portable Number (CCPN) network capability?

If the MSC will have the capability to query the NP database, it should support the SS7 CCPN network capability. The MSC may not use the AIN for sensing queries to the NP database. It can support IN (to be defined by T1S1) or use IS-41 (with or without WIN) to interrogate the NP database. If the NP database query is performed by the MSC, the MSC then will use ISDN User Part (ISUP) signaling to pass the LRN, dialed number, and Forward Call Indicator (FCI) as is specified for supporting NP.

How is the appropriate subscriber information - ANI (charge number) and calling party number correctly populated?

Calling party number and ANI will be populated as is done today.

5.2.3.1.1 To Wireline

What changes need to be made to allow the MSC to do the LNP query for a local call?

An MSC will be required to properly route a mobile station dialed call even if the called number is a ported number. While proper routing for some calls will require an NP query, an IS-41-B or earlier MSC may not need to perform such queries itself. As an alternative, it might route calls to the Public Switched Telephone Network (PSTN), with the query being performed in the wireline network. The choice between the two approaches may depend on business arrangements between a wireless carrier and adjacent wireline networks. Nevertheless, there would be some advantages if the MSC

were able to recognize when a mobile station originated call is a call to a ported-in number; otherwise unnecessary NP query will be made, and, if the queries are performed in the PSTN, unnecessary double trunking of calls out to the PSTN and back in would occur.

For an IS-41-C or later MSC, the situation is more complex since origination requests and feature requests to the home system's HLR (or a WIN query to an SCP) may replace the dialed digits with a new telephone number to be used in routing the call. Depending on the degree of location portability ultimately mandated by regulators, proper treatment of these calls may only require that an NP query be launched for the telephone number returned by the HLR (or SCP). In this case the options are similar to the options for a Rev. B system. However, if portability across rate centers is ultimately allowed, an NP query may be required before deciding whether certain IS-41-C origination triggers have been hit (e.g., the Intra-LATA toll trigger). In this case, two NP queries may be needed, one before the IS-41-C or WIN query, one after. This would require direct MSC support of the NP query, and the option to route the call to the PSTN for that query would not be available.

How will the MSC interact with the routing databases when defined?

If the MSC uses the NP database it has to support the AIN or IN interface to the NP database by at least sending the specified query message (e.g., Info_Analyzed) and receiving the specified response (e.g., Analyzed_Route). The MSC need not support AIN call models, it just has to use AIN messages for the NP database query and response. If the MSC uses a wireless industry NP database it may support an IS-41 interface.

How is the call processed if the call is beyond the local area?

For inter-LATA calls, the MSC routes the call to the appropriate interexchange carrier (e.g., the caller's presubscribed interexchange carrier (IXC) , the called party's presubscribed IXC or the cellular carrier's IXC). This assumes that the IXC will perform the query function as the N-1 network.

What types of triggers are used?

If AIN or IN is used, the wireline standards/requirements specified trigger (e.g., Public Office Dialing Plan, PODP) is used. If IS-41 is used and WIN is specified, the Info_Analyzed trigger may be used.

What are the protocol impacts - IS-41, IS-652, etc.?

If IS-41 or IS-652 is used between the MSC and the NP database, it may or may not be impacted depending on whether a new message or new parameters are used in the existing message.

Are there any efficiencies that can be applied?

If the majority of portable numbers remain with the donor switch then the Query on Release (QoR) method may be applied for efficiencies.

5.2.3.1.2 To Wireless

Are there efficiencies which can be developed for delivery to a wireless user or must the procedure be the same as for wireline delivery?

The procedure is likely to be similar to the wireline unless it is desirable to add a cellular/PCS indicator in the NP database so that the MSC can receive that indication in the response from the NP database.

Another option is to have the NP database perform the location request process when it detects the dialed number is a cellular/PCS number.

What are the protocol impacts and performance implications? Can efficiencies be implemented?

If cellular/PCS indication is to be provided in the response, changes to the protocol (e.g., AIN, IN, or IS-41) will be expected. Efficiency can be obtained if the mobile station is roaming. But if the mobile station is not roaming, efficiency is lost and performance is slightly worst due to the additional unnecessary location request process done by the NP database.

Can we avoid the trunking to the home location and then trunking to the visited location?

Using the scheme described above, double trunking can be avoided if the mobile is roaming.

How is the location request message routing handled (e.g., GTT at STPs, GTT to HLR, etc.)?

10-digit GTT at the STP or MSC's local table is not feasible because of extensive administration effort is required. The best approach will be to pass the HLR's point code or X.25 address in the response from the NP database along with the cellular/PCS indicator. Otherwise, the message relaying service provided by a third-party can be used. The third party can also be used to return the HLR's address (e.g., SS7 point code or X.25 address).

5.2.3.2 Call Delivery to Mobile Station

How will call delivery to a mobile station be accomplished?

When a mobile station dialed call happens to be a call to another mobile, the serving system for the mobile station originating the call and the home system of the called mobile will often be a different system. In these cases, the serving system for the mobile station originating the call can treat it in the same way as it treats a mobile station dialed call to a wireline phone (e.g., launch a query for portable number). If the LRN of the

serving MSC is sent to the home system during the registration process (i.e., IS-41 enhancement is required) and if look ahead for busy is not performed, the home/gateway MSC will get the LRN from the HLR from the location request process and routes the call accordingly. The route request process (look ahead for busy) can still be performed if desired.

When, by chance, the serving system for the mobile station originating the call and the home system of the called mobile is the same system, and if the MSC recognizes this fact, there is no need for an NP query prior to the launching of a LOCREQ.

However, when the mobile station is roaming and the locreq is returned, an NP query may be needed. The digits (destination) returned in the locreq may not be carrying a Temporary Location Directory Number (TLDN); it may, for instance, be carrying Forwarding Number (e.g., for CFU); and the subscriber to whom the call is being forwarded may have ported that number. (Even if a TLDN is actually returned, there is a possibility that the Serving System has changed the LEC it uses for interconnection to the PSTN, and ported the entire block of numbers it received from one LEC to the other.) Figure 4 depicts this scenario for call delivery to a roamer.

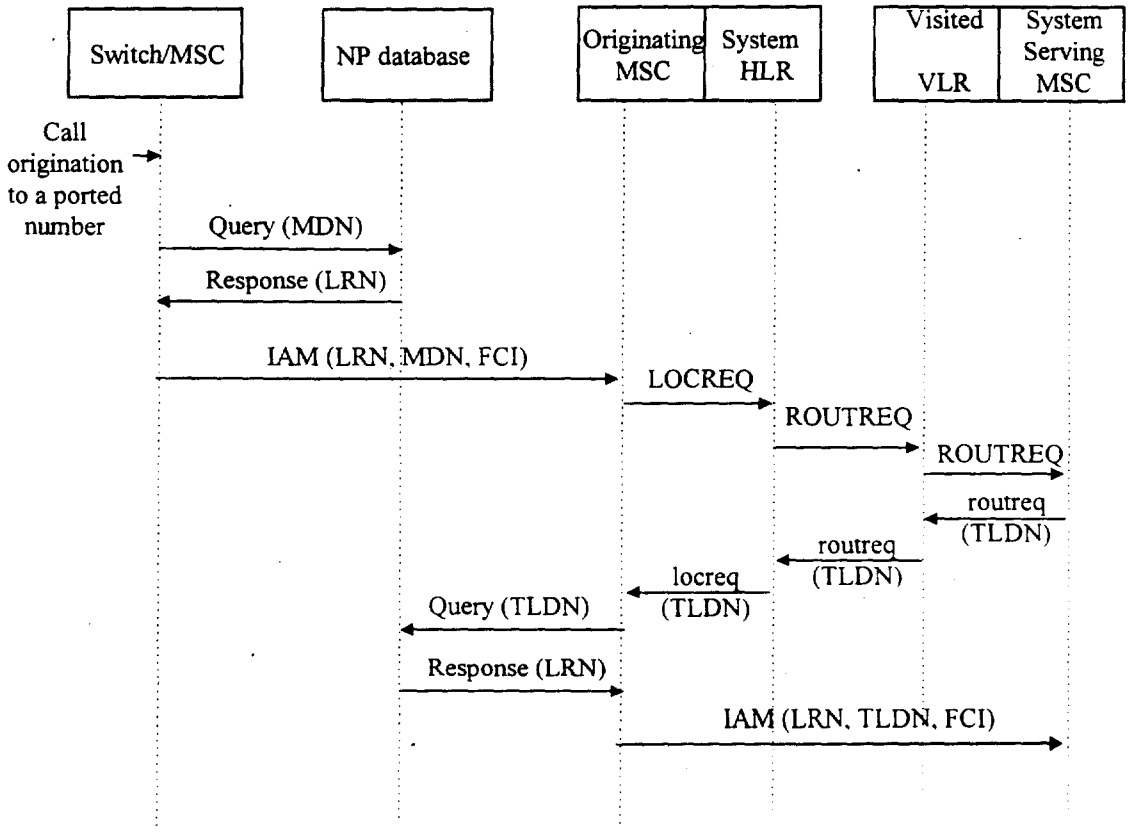

Figure 4 - Call delivery to a roaming mobile station